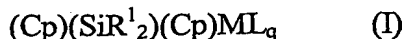


CLAIMS

1. A process for preparing silicon-bridged metallocene compounds of formula (I):



wherein (SiR^1_2) is a divalent group bridging the two Cp rings, the R^1 groups, equal to or different from each other, are hydrogen atoms, or linear or branched, saturated or unsaturated $\text{C}_1\text{-C}_{20}$ alkyl, $\text{C}_3\text{-C}_{20}$ cycloalkyl, $\text{C}_6\text{-C}_{20}$ aryl, $\text{C}_7\text{-C}_{20}$ alkylaryl or $\text{C}_7\text{-C}_{20}$ arylalkyl groups, two R^1 can optionally join to form a 3-7 membered ring;

Cp, equal to or different from each other, is a substituted or unsubstituted cyclopentadienyl group, optionally condensed to one or more substituted or unsubstituted, saturated, unsaturated or aromatic rings, containing from 4 to 6 carbon atoms, optionally containing one or more heteroatoms;

M is a transition metal belonging to group 3, 4, 5, 6 or to the lanthanide or actinide groups of the Periodic Table of the Elements (IUPAC version);

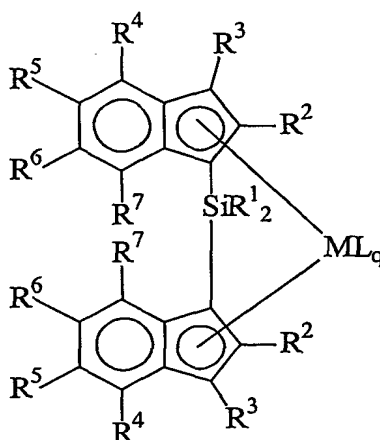
the substituents L, equal to or different from each other, are monoanionic sigma ligands selected from the group consisting of linear or branched, saturated or unsaturated $\text{C}_1\text{-C}_{20}$ alkyl, $\text{C}_3\text{-C}_{20}$ cycloalkyl, $\text{C}_6\text{-C}_{20}$ aryl, $\text{C}_7\text{-C}_{20}$ alkylaryl and $\text{C}_7\text{-C}_{20}$ arylalkyl groups, optionally containing one or more Si or Ge atoms;

q is an integer ranging from 0 to 2, being equal to the oxidation state of the metal M minus 2;

said process comprises the following steps:

- a) reacting, at a temperature of between -10°C and 70°C , a ligand of formula $(\text{Y-Cp})(\text{SiR}^1_2)(\text{Cp-Y})$ with about 2 molar equivalents of an alkylating agent of formula TH_w , L_jB or LMgL' , wherein Cp, R^1 , and L have the meaning reported above; T is lithium, sodium or potassium, H is an hydrogen atom, w is 0 or 1, when w is 0 the compound TH_w is metallic lithium, sodium or potassium, when w is 1 the compound of formula TH_w is an hydride of lithium, sodium or potassium; L' is an halogen atom selected from chlorine, bromine and iodine; B is an alkali or alkali-earth metal; and j is 1 or 2, j being equal to 1 when B is an alkali metal, and j being equal to 2 when B is an alkali-earth metal; the groups Y, the same or different from each other, are suitable leaving groups;
- b) after the reaction has been completed, adding at least q molar equivalents of an alkylating agent of formula L_jB or LMgL' ; and

- c) reacting, at a temperature of between -10°C and 70°C , the product obtained from step b) with at least 1 molar equivalent of a compound of formula ML'_s , wherein M have the meaning reported above; s is an integer corresponding to the oxidation state of the metal and ranges from 3 to 6; and L' is an halogen atom selected from chlorine, bromine and iodine.
2. The process according to claim 1, for preparing a silicon-bridged metallocene compound of formula (II):



(II)

wherein:

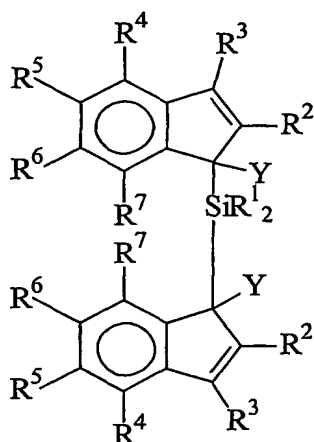
M, L, q and R^1 have the meaning reported in claim 1;

R^2 , equal to or different from each other, are hydrogen atoms or linear or branched, saturated or unsaturated $\text{C}_1\text{-C}_{20}$ -alkyl, $\text{C}_3\text{-C}_{20}$ -cycloalkyl, $\text{C}_6\text{-C}_{20}$ -aryl, $\text{C}_7\text{-C}_{20}$ -alkylaryl or $\text{C}_7\text{-C}_{20}$ -arylalkyl radicals, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements;

R^3 , R^4 , R^5 , R^6 and R^7 , equal to or different from each other, are hydrogen atoms or linear or branched, saturated or unsaturated $\text{C}_1\text{-C}_{20}$ -alkyl, $\text{C}_3\text{-C}_{20}$ -cycloalkyl, $\text{C}_6\text{-C}_{20}$ -aryl, $\text{C}_7\text{-C}_{20}$ -alkylaryl or $\text{C}_7\text{-C}_{20}$ -arylalkyl radicals, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements; two vicinal R^3 , R^4 , R^5 , R^6 and R^7 can also form one or more condensed 5 or 6 membered saturated or unsaturated rings optionally containing heteroatoms belonging to groups 13-16 of the Periodic Table of the Elements, said rings can bear alkyl substituents;

said process comprises the following steps:

- a) reacting, at a temperature of between -10°C and 70°C , a ligand of formula (III)

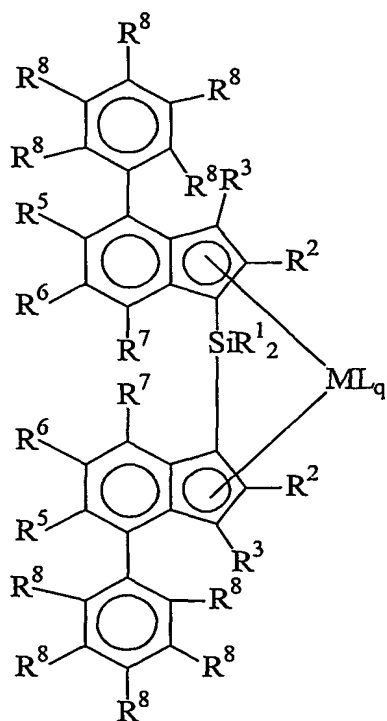


(III)

or one of its double bond isomers;

wherein R^1 , R^2 , R^3 , R^4 , R^5 , R^6 and R^7 have the meaning described above; with about 2 molar equivalents of an alkylating agent of formula TH_w , L_jB or LMgL' , wherein L has the meaning reported above; T is lithium, sodium or potassium, H is an hydrogen atom, w is 0 or 1, when w is 0 the compound TH_w is metallic lithium, sodium or potassium, when w is 1 the compound of formula TH_w is an hydride of lithium, sodium or potassium, L' is an halogen atom selected from chlorine, bromine and iodine; B is an alkali or alkali-earth metal; and j is 1 or 2, j being equal to 1 when B is an alkali metal, and j being equal to 2 when B is an alkali-earth metal; the groups Y, the same or different are suitable leaving groups;

- b) after the reaction has been completed, adding at least q molar equivalents, of a compound of formula L_jB or LMgL' ; and
- c) reacting, at a temperature of between -10°C and 70°C , the product obtained from step b) with at least 1 molar equivalent of a compound of formula ML'_s , wherein M have the meaning reported above; s is an integer corresponding to the oxidation state of the metal and ranges from 3 to 6; and L' is an halogen atom selected from chlorine, bromine and iodine.
3. The process according to claims 1 or 2, for preparing a silicon-bridged metallocene compound of formula (IV):



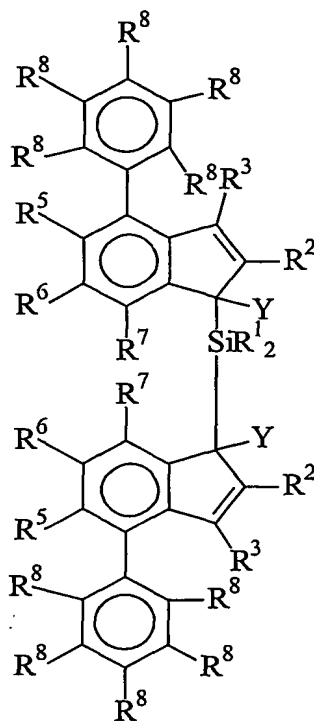
(IV)

wherein:

M , L , q , R^1 , R^2 , R^3 , R^5 , R^6 and R^7 have the meaning described in claims 1 or 2; and R^8 is a hydrogen atom, or a linear or branched, saturated or unsaturated C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl or C_7 - C_{20} -arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements;

said process comprises the following steps;

- a) reacting, at a temperature of between -10°C and 70°C , a ligand of formula (V)



(V)

or one of its double bond isomers;

wherein R^1 , R^2 , R^3 , R^4 , R^5 , R^6 , R^7 and R^8 have the meaning described above;

with about 2 molar equivalents of an alkylating agent of formula TH_w , L_jB or LMgL' , wherein L has the meaning reported above; T is lithium, sodium or potassium, H is an hydrogen atom, w is 0 or 1, when w is 0 the compound TH_w is metallic lithium, sodium or potassium, when w is 1 the compound of formula TH_w is an hydride of lithium, sodium or potassium, L' is an halogen atom selected from chlorine, bromine and iodine; B is an alkali or alkali-earth metal; and j is 1 or 2, j being equal to 1 when B is an alkali metal, and j being equal to 2 when B is an alkali-earth metal; the groups Y , the same or different from each other, are suitable leaving groups;

- b) after the reaction has been completed, adding at least q molar equivalents of a compound of formula L_jB or LMgL' ; and
- c) reacting, at a temperature of between -10°C and 70°C , the product obtained from step b) with at least 1 molar equivalent of a compound of formula ML'_s , wherein M have the meaning reported above; s is an integer corresponding to the

oxidation state of the metal and ranges from 3 to 6; and L' is an halogen atom selected from chlorine, bromine and iodine.

4. The process according to anyone of claims 1 to 3 wherein step b) is carried out in a time ranging from 1 minute to 6 hours after step a).
5. The process according to anyone of claims 1 to 4 wherein Y is a hydrogen atom or a $-\text{SiR}_3$ or $-\text{SnR}_3$ group, wherein the groups R are linear or branched saturated or unsaturated $\text{C}_1\text{-C}_{20}\text{-alkyl}$, $\text{C}_3\text{-C}_{20}\text{-cycloalkyl}$, $\text{C}_6\text{-C}_{20}\text{-aryl}$, $\text{C}_7\text{-C}_{20}\text{-alkylaryl}$ or $\text{C}_7\text{-C}_{20}\text{-arylalkyl}$ radicals.
6. The process according to anyone of claims 1 to 5 wherein the metal M is Ti, Zr or Hf.
7. The process according to anyone of claims 1 to 6 wherein the compounds ML_s are ZrCl_4 , ZrBr_4 , ZrF_4 , HfCl_4 , HfBr_4 , HfF_4 , TiCl_4 , TiBr_4 and TiF_4 ;
8. The process according to anyone of claims 1 to 7 wherein in step b) $1+q$ molar equivalents of a compound of formula L_jB or LMgL' wherein L, L' and B have the meaning as described in claim 1 is added.
9. The process according to anyone of claims 1 to 8 wherein step a) and b) are carried out at a temperature ranging from -5°C and $+55^\circ\text{C}$.
10. The process according to anyone of claims 1 to 9 wherein step c) is carried out at a temperature ranging from 0°C and 60°C .